

142,748

Figs. 9, 10 & 11
are not in

{ U.S. 1,352,103
U.S. 1,326,992

LOCKS IN
BOTH
DIRECTIONS

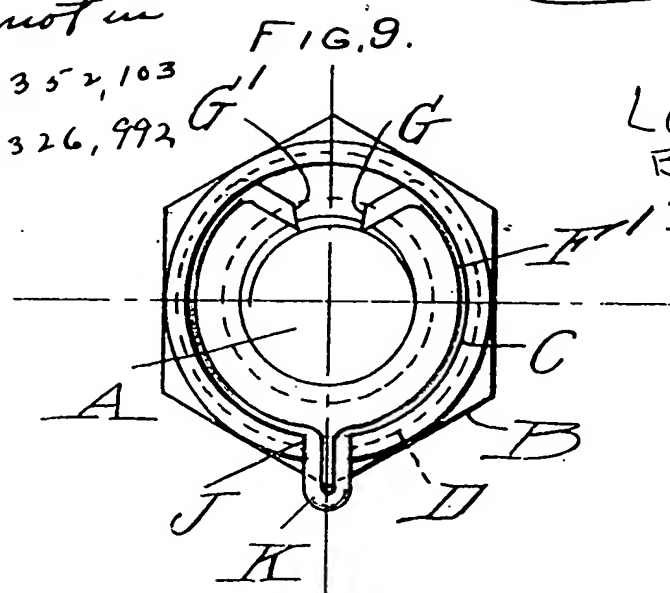


FIG. 10.

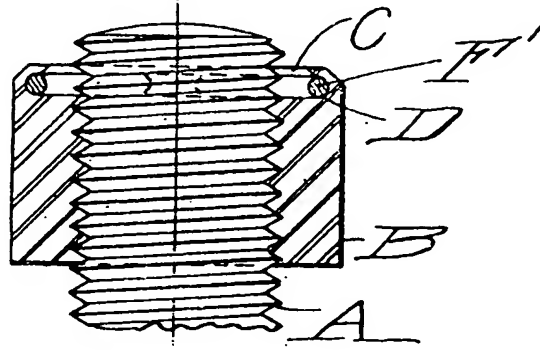
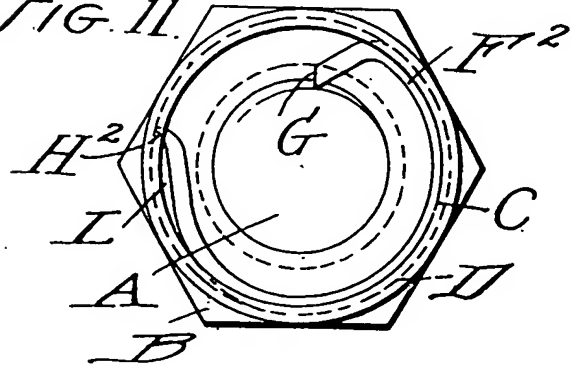
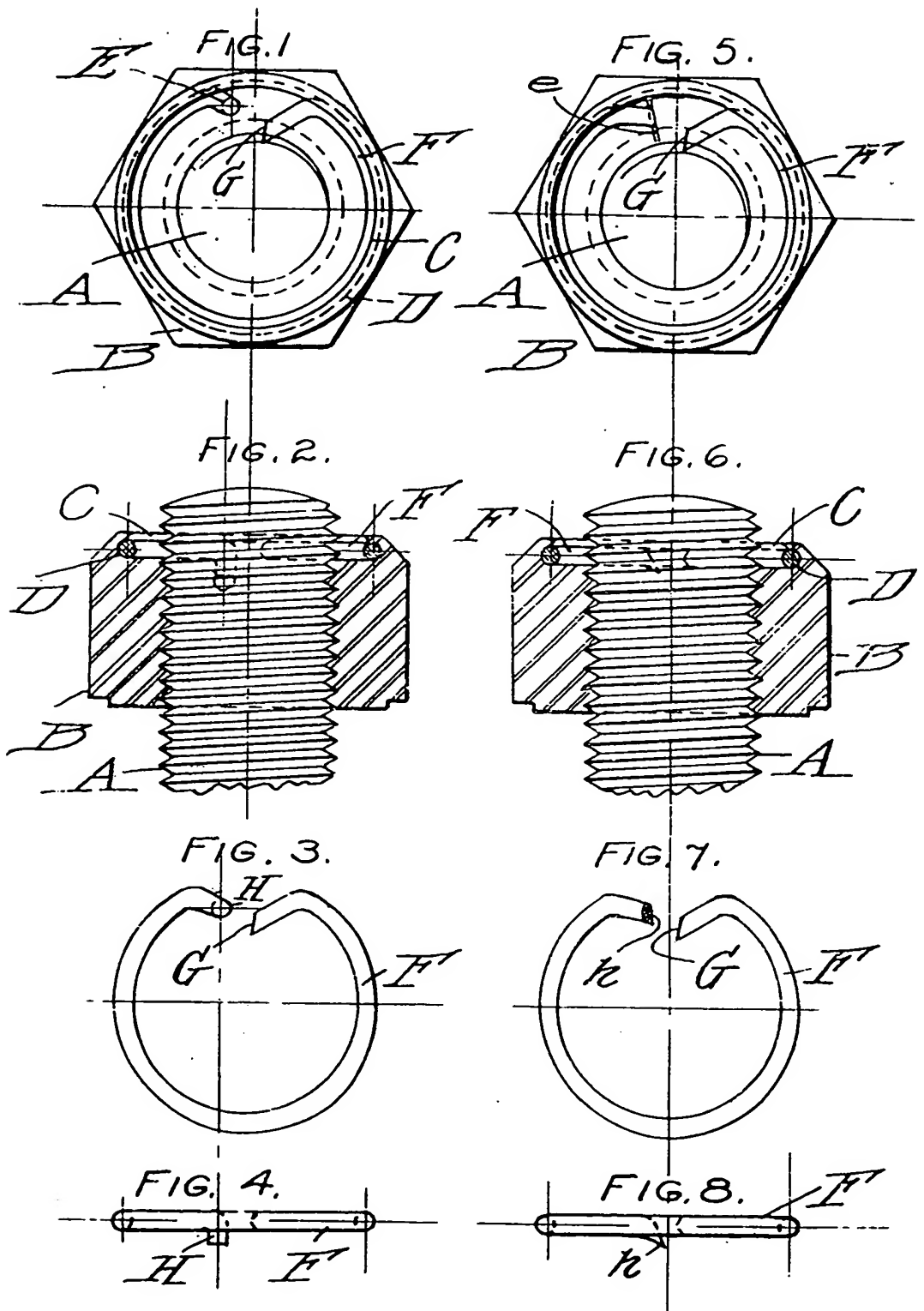


FIG. 11.





[This drawing is a reproduction of the Original on a reduced scale.]

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COPY

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142,748

PATENT



SPECIFICATION

Application Date, Nov. 4, 1919. No. 27,133/19.

Complete Accepted, May 13, 1920.

COMPLETE SPECIFICATION.

Improvements in Nut Locks.

I, NAPOLEON ROY THIBERT, Manufacturer, of 2 Heard Street, in the City of Worcester, County of Worcester, State of Massachusetts, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in
5 and by the following statement:—

This invention relates to a lock-nut of the type involving a locking member in the form of a circular spring located in a recess in the nut and having an integral pawl on the end for engaging the thread of the bolt.

The principal objects of the invention are to provide a construction which
10 will be extremely cheap to make by reason of the fact that the nut itself can be prepared for the reception of the spring in a most simple and inexpensive manner; to provide a spring which will be detachable and which will be of such a nature that there will be no probability of its being placed in position incorrectly; that is, so as to lock the nut against turning in the direction in
15 which it is intended to turn; to provide a spring which although it needs to be placed in a certain position to secure the full locking effect, yet can be placed anywhere around the circle and will necessarily eventually come into locking position, and to provide a modification in which the nut is locked against turning in both directions; this modification being useful in certain
20 cases where the creeping of the nut forwardly on the bolt would tend to bind some parts with which it is connected.

The invention also involves improvements in details as will appear.

Reference is to be had to the accompanying drawings in which

- 25 Fig. 1 is a plan view of one embodiment of this invention;
Fig. 2 is a sectional view of the same;
Fig. 3 is a plan of the locking spring;
Fig. 4 is a side view of the locking spring;
Fig. 5 is a plan of a slightly modified form of the invention;
Fig. 6 is a sectional view of the latter;
30 Fig. 7 is a plan of the locking spring thereof;
Fig. 8 is a side view of the same locking spring;
Fig. 9 is a plan of another modification;
Fig. 10 is a sectional view thereof, and
Fig. 11 is a plan of another modification.

35 Referring first to the first four figs. A designates the end of a bolt on which

[Price 1/-]

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the locking nut B is screwed. The nut B is provided with a circular recess C in its top face, the wall of said recess being undercut so as to leave a circular groove D. A longitudinal hole E is drilled a little way into the nut at a convenient point within the recess C to provide a depression for anchoring the spring.

F designates a partial circular wire spring which is shaped to fit tightly in the groove D throughout its circular extent. One end of this spring is sharpened and bent inwardly to form an integral pawl G which will engage in the thread of the bolt. The other end H of the circular spring F is bent downwardly at right angles to the plane of the spring to provide a projection for entering the depression E to prevent the spring from rotating in the recess C.

In the form of the invention shown in Figs. 5, 6, 7 and 8 all the elements above mentioned are present, except that in place of the hole E I have provided a radial groove *e* in the floor of the recess C and the end of the wire spring is sharpened to provide a pawl *h*, turned downwardly at right angles to the plane of the wire as is the case in Fig. 4. This modification is made for the purpose of cheapening the product as the depression *e* can be made by means of a punching tool in a very rapid manner, and need not be located in any particular place circumferentially or radially so that there is no time lost in fitting the parts together or in gauging the exact position of this groove.

The use of the device is the same in both cases. The circular spring F is snapped in position in the groove D with its end projection H or *h* in the hole E or the groove *e*. Or if the operator does not take pains to place the end in exactly the proper position the operation of the device will eventually bring it around so that it will snap into position. It is to be noted also that this projection H or *h* is so noticeable that anybody with any mechanical experience at all would never place the spring in such position that it would project upwardly. He would know at once that it would have no utility in that position. Therefore it is practically fool-proof because the user will always put the projection down into the bottom of the recess, and if he does that there is no danger of the spring being put in, in a left-handed manner. As the spring fits tightly through-out its circular extent in the groove D it furnishes a strong backing for the pawl G all the way round.

In other words, any tendency which there may be for the pawl G to leave its seat in the screw-thread will be resisted by the spring throughout its length, and particularly at the point just opposite the pawl so it cannot give or jar loose.

When the parts are assembled in this manner the spring cannot rattle out of the nut and the nut can be handled as an article of commerce. But if desired the nuts and springs can be sold separately and the spring applied by the user on account of the fact that he will not be likely to get it in left-handed as stated above.

The nut is applied to the bolt in the ordinary way and screwed up to the desired position. If the spring is not yet in place it can be put in at this time. The pawl end G of the wire spring will slip around in the thread of the nut but when the nut is in final adjusted position the pawl will engage tightly in the thread and lock the nut in its place, preventing any rotation of the nut tending to unscrew it from the bolt. This action particularly will take place as the partial circular wire spring fits tightly in the groove through-out its circular extent and there can be no backlash between the spring and the nut. In practice it has been found that vibration will tend to tighten the lock nut on the screw.

It is to be noted that the spring seats in the undercut groove D and tends to expand outwardly against the deepest surface thereof so that it will not become detached even when the nut is not on the screw. Furthermore as the end H or *h* does not project beyond the circle the spring can be removed by

inserting a sharp instrument and prying up this end first. This is particularly so in the case shown in Figs. 5 to 8.

In the form shown in Figs. 9 and 10 the nut is intended for use in those places in which it is so placed as to be apt to bind some of the parts with which it is connected, if it screws up on the bolt beyond the point at which it is originally adjusted. There are numerous places in which this difficulty occurs and it will not be necessary to point them out in detail.

In this case the elements A, B, C, D, are substantially the same as in the cases above mentioned, but there is a radial slot J cut through the outer wall of the nut that bounds the circular recess, and the spring F¹ is provided with two pawls G and G¹ both engaging in the same thread of the screw or bolt A. It has near its center an outward bend K which enters the slot J to prevent its turning circumferentially. Otherwise it has the properties of the spring described above. It is used in substantially the same way, and has most of the properties which I have described in connection with the other forms of the invention. But it has the additional pawl G¹ which prevents the bolt screwing up on the nut. In other words this is for a nut which has to be adjusted to a certain tightness, and in order to work properly should retain exactly that position with reference to the bolt, and it is prevented from screwing either on or off by the double pawl construction.

In the form shown in Fig. 11 the letters A, B, C, D, G, represent substantially the same elements as in Fig. 1. The wire spring F² fits in the groove D and has its pawl G. Its other end has a point H² which constitutes a pawl to engage the smooth wall of the depression D of the nut so as to act to lock the spring against moving backward therein. There is a space L formed by a bend in the wire spring to permit the insertion of the end of a nail or other sharp point to detach the spring if desired.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A lock nut comprising a screw-threaded nut having a circular grooved recess therein, a partial circular wire spring fitting tightly in the groove substantially throughout its circular extent, one end of said spring engaging in the thread on the bolt, and the other end being located near said thread engaging end and being bent downwardly, the recess being provided with a depression on its inner surface, for receiving the last named bent end to prevent rotation of the spring in the recess.

2. A lock nut comprising a screw-threaded nut having a circular grooved recess therein and a radial groove in the bottom of said recess, a partial circular wire spring fitting tightly in the recess, one end of said spring being sharpened and bent inwardly for pawl-like engagement in the thread of the bolt, the other end being bent downwardly and sharpened for engagement in said groove.

3. A lock nut comprising a screw-threaded nut having a circular grooved recess therein, a partial circular wire spring fitting tightly in said groove throughout substantially its entire length and having both ends sharpened and bent inwardly for pawl-like engagement in the thread of the bolt to prevent rotation of the bolt in both directions, the spring having at a point intermediate between said pawls an outward bend in its own plane, the nut having a radial slot cut entirely through the outer wall bounding said circular recess for receiving said outward bend and preventing the creeping of the spring in the recess.

4. A lock nut comprising a screw-threaded nut having a circular grooved recess therein, a partial circular wire spring fitting tightly in said groove throughout substantially its entire length one end of said spring being sharpened and bent inwardly for pawl like engagement in the thread of the

bolt, the other end being bent outwardly and sharpened for engagement in the side of said grooved recess.

5. The various lock nuts as claimed in Claims 1 to 4 substantially as described and shown with reference to Figs. 1 to 11.

Dated this 4th day of November, 1919.

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